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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,777	02/20/2002	Shigeki Matsuda	111995	3646

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EXAMINER	
WONG, EDNA	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/077,777	MATSUDA ET AL.	
	Examiner	Art Unit	
	Edna Wong	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

This is in response to the Amendment dated December 3, 2003. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Specification

The abstract of the disclosure has been objected to.

The objection of the abstract has been withdrawn in view of Applicants' amendment.

Claim Objections

Claims **1, 3-4 and 9** have been objected to because of minor informalities.

The objection of claims 1, 3-4 and 9 has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 112

Claims **1-15** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 1-15 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

Claims **1-15** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **EP 597,131** in combination with **Matsuda** (US Patent No. 4,565,585).

The rejection of claims 1-15 under 35 U.S.C. 103(a) as being unpatentable over EP 597,131 in combination with Matsuda has been withdrawn in view of Applicants' remarks.

Response to Amendment

Claim Objections

Claims **1-5, 9 and 13** are objected to because of the following informalities:

Claim 1

line 4, it is suggested that the word "steps" be amended to the word -- step --.

line 11, it is suggested that the words "a solvent in the form water" be amended to the word -- water --.

Claim 2

line 8, it is suggested that the words "a solvent in the form water" be amended to the word -- water --.

line 9, it is suggested that the word "electrolysis" be amended to the words --

electrolytic treatment --.

Claim 3

line 2, it is suggested that the word -- dissolving -- be inserted after the word "comprising".

line 2, it is suggested that the word "dissolved" be deleted.

Claim 4

line 3, it is suggested that the word -- dissolving -- be inserted after the word "comprising".

line 3, it is suggested that the word "dissolved" be deleted.

line 4, it is suggested that the words "in the form of the article" be deleted. This is repetitive of the limitation in claim 4, line 2.

Claim 5

line 2, it is suggested that the word "electrolysis" be amended to the words -- the electrolytic treatment --.

Claim 9

line 10, it is suggested that the word "from" be amended to the word -- of --.

Claim 13

line 6, it is suggested that the word "removing" be amended to the word -- separating --. See claim 9, line 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims **2 and 5** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2

lines 5-7, it appears that "**the metal material** for which the dissolution-precipitation equilibrium potential at which **the ions** dissolved in the phosphate chemical treatment bath are reduced and precipitate as the metal is equal to or greater than -830 mV is the same as **the metal ions** for which the dissolution-precipitation equilibrium potential at which **the metal ions** dissolved in the phosphate chemical treatment bath are reduced and precipitate as the metal is equal to or greater than -830 mV recited in claim 1, lines 8-10. However, it is unclear if they are. If they are not, then what are the

differences between the metal material and the metal ions; and the ions and the metal ions?

Claim 5

lines 2-4, "wherein an electrode used in electrolysis for making the ORP of the phosphate chemical treatment bath equal to or greater than 700 mV" lacks antecedent basis. There is no recitation that an electrode is used to do this. It is suggested that the word -- is -- be inserted after the word "electrode".

Claim Rejections - 35 USC § 103

Claims **1-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Matsuda** (US Patent No. 5,645,706).

Matsuda teaches an electrolytic phosphate chemical treatment method of forming a film composed of a phosphate compound and a metal that is reduced and precipitated from an ionic state on the surface of a metal material article to be treated, comprising the step of:

performing the electrolytic treatment on said article (e.g., stainless steel) [col. 7, lines 14-18] to be treated in a phosphate chemical treatment bath by contacting said metal material article having electrical conductivity with said phosphate chemical treatment bath containing: phosphate ions, phosphoric acid, nitrate ions, metal ions that form a complex with phosphate ions in said phosphate chemical treatment bath, and

metal ions at which the metal ions dissolved in said phosphate chemical treatment bath are reduced and precipitate as metal, and is substantially free of metal ions other than those which are a component of the film (col. 7, lines 37-45);

wherein the oxidation-reduction potential (ORP) of said phosphate chemical treatment bath indicated as the potential relative to a standard hydrogen electrode is maintained at equal to or greater than 700 mV (= 460-860 mV) [col. 13, lines 13-18].

The electrolytic treatment uses for an electrode material that dissolves in the treatment bath, the metal ions that forms the complex with the phosphoric acid and the phosphate ions in the phosphate chemical treatment bath (i.e., $3(Zn^{2+}, Fe^{2+}) + 2H_2PO_4^- \rightarrow (Zn, Fe)_3(PO_4) + 4H^+$) [col. 3, line 5] (= the film-forming material such as zinc, etc., which is used at the anode is dissolved and reacted with the phosphate ion or nitrate ion in solution phase to form a film on the surface of the cathode (the material to be treated) [col. 7, lines 2-7].

An amount of Fe ions is dissolved into the treatment bath from an Fe electrode, when performing a cathodic treatment of said article to be treated and using the Fe electrode as the electrode that dissolves in the treatment bath (col. 11, limes 9-20; and col. 30, lines 6-18).

The article to be treated is a steel material (= stainless steel) [col. 7, lines 14-18], the method further comprises an amount of Fe ions is dissolved into the treatment bath in an anodic treatment in which said steel material is dissolved as an anode (col. 11, lines 53-60).

The metal ions that form the complex with the phosphoric acid and the phosphate ions in the phosphate chemical treatment bath are at least one of Zn, Fe, Mn or Ca ions (= Zn, Fe and Ca) [col. 2, lines 46-52].

The NO, NO_2 and/or N_2O_4 gases generated and dissolved (col. 2, lines 54-67) in a treatment tank wherein the treatment tank is separated into an electrolytic treatment tank **1** that carries out electrolytic treatment and an auxiliary tank **3** that does not carry out electrolytic treatment, circulating the treatment bath between the two tanks, and providing a mechanism that opens liquid to of the treatment bath to the atmosphere either between the electrolytic treatment tank and the auxiliary tank (col. 10, lines 26-42; and Figs. 1-3).

A filter **3** having a mechanism that filters the treatment liquid is used for the auxiliary tank that does not carry out electrolytic treatment (col. 10, lines 26-42; and Fig. 3).

A portion of the treatment liquid is removed, through a liquid circulation circuit **2**, at a location prior to being introduced into a filter material in a filter **3**, exposing the removed treatment liquid to the atmosphere (at **14**), and returning it to the electrolytic treatment tank **13** (col. 10, lines 26-42; and Fig. 3).

The treatment bath is maintained in a constant state by measuring an oxidation-reduction potential value of the treatment bath and changing an amount and/or composition of replenishing chemical corresponding to the change in that value (col. 9, lines 32-45).

The ORP of the phosphate chemical treatment bath is equal to or greater than 770 mV (= 460-860 mV) [col. 13, lines 13-18].

The ORP of the treatment bath is equal to or greater than 840 mV (= 460-860 mV) [col. 13, lines 13-18].

Matsuda does not teach wherein the metal ions are those for which the dissolution-precipitation equilibrium potential is equal to or greater than -830 mV, which is the cathodic reaction decomposition potential of the solvent in the form of water when indicated as the hydrogen standard electrode potential.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because these metal ions are open to being the same as the metal ions that form a complex with phosphate ions in said phosphate chemical treatment bath (i.e., iron, manganese, nickel, calcium, zinc, etc.) [col. 2, lines 46-52]. It appears that these ions would have also been those for which the dissolution-precipitation equilibrium potential is equal to or greater than -830 mV, which is the cathodic reaction decomposition potential of the solvent in the form of water when indicated as the hydrogen standard electrode potential, unless proven otherwise.

As to wherein the amount of Fe ions dissolved into the treatment bath from an Fe

electrode is controlled in order to make said ORP of the phosphate chemical treatment bath equal to or greater than 700 mV, Matsuda teaches that since at an ORP of 560 mV or greater, the treatment bath contains paramagnetic iron (Fe^{3+}). If Fe^{3+} dissolves in the treatment bath(s) and disappear leaving no Fe^{3+} in the treatment bath(s), the ORP will by necessity fall below 560 mV (col. 29, lines 37-47). Thus, the amount of Fe ions dissolved into the treatment bath from an Fe electrode would have been controlled to make the ORP of the phosphate chemical treatment bath equal to or greater than 700 mV.

As to wherein an electrode used in electrolysis for making the ORP of the phosphate chemical treatment bath equal to or greater than 700 mV is an insoluble metal material, insoluble electrodes are known in the art. Nevertheless, this is well within the skill of the artisan because this would have stabilized the chemical reactions in the bath so that bath control is facilitated.

As to wherein a chemical that contains Fe ions which replenishes the phosphate chemical treatment bath is an Fe-phosphate complex in order to make the ORP of said phosphate chemical treatment bath equal to or greater than 700 mV, Matsuda teaches an anode reaction of $3(Zn^{2+}, Fe^{2+}) + 2H_2PO_4^- \rightarrow (Zn, Fe)_3(PO_4) + 4H^+$ (col. 3, line 5). It appears that these Fe-phosphate complexes would have made the ORP of said phosphate chemical treatment bath equal to or greater than 700 mV, unless proven

otherwise.

Furthermore, it has been held that a newly discovered use or function of components does not necessarily mean the system is unobvious since this use or function may be inherent in the prior art. *Ex parte Pfeiffer* 135 USPQ 31.

As to wherein the NO, NO_2 and/or N_2O_4 gases generated and dissolved (col. 2, lines 54-67) in a treatment tank are removed from the treatment bath; and a means of separating the NO, NO_2 and/or N_2O_4 gases formed in the treatment bath accompanying the electrolytic treatment from the treatment bath, this is well within the skill of the art to remove undesirable reaction products from an electrolytic reaction.

As to wherein the auxiliary tank that does not carry out the electrolytic treatment has a mechanism in which the treatment liquid is passed through a permeable solid structure; and wherein the solid structure is a film, the filter is deemed be a permeable solid structure since a fluid is passed through it. A permeable film in a filter is deemed to be a conventional structure in the art. The permeable film would have trapped the contaminants in the bath and passed a purified bath.

Observations

The claim 1, lines 12-13, recites "is substantially free of metal ions other than those which are a component of the film". The phosphate chemical treatment bath

disclosed by Matsuda contains metal ions. The metal ions disclosed by Matsuda are the ions which are a component of the film, and those metal ions not disclosed would have been the ions the treatment bath is substantially free of.

As to preventing sludge formation, Matsuda appears to disclose a method at least in a similar manner as instantly claimed. There does not appear to be any method limitations set forth in the instant claims to distinguish the instant claims from the prior art. Therefore, it would have been within the skill of the art to expect that the method of Matsuda prevents sludge formation to some degree, unless proven otherwise.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1495.

Edna Wong
Primary Examiner
Art Unit 1753

EW
January 10, 2004